



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/743,873	12/24/2003	Takao Noda	Q78691	9340
23373	7590	07/01/2004	EXAMINER	
SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			VIJAYAKUMAR, KALLAMBELLA M	
			ART UNIT	PAPER NUMBER
			1751	

DATE MAILED: 07/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/743,873	NODA ET AL.	
	Examiner	Art Unit	
	Kallambella Vijayakumar	1751	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-7 and 11-15 is/are rejected.
- 7) ☒ Claim(s) 3,4 and 8-10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/785,258.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>1</u> . | 6) <input type="checkbox"/> Other: _____ |

Detailed Action

- This is a divisional of SI. No. 09/785,258 filed 02/20/2001, now US Patent 6,6999,618 and claims the benefit of 60/214,974 filed 06/28/2000.
- Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d) for the JP 2000/126494 filed 24/26/2000. The certified copy has been filed in parent Application No. 09/785,258, filed 02/20/2001. Claims 1-15 are currently pending with the application. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A (1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the examiner on form PTO-892 has cited the references, they have not been considered.

The information disclosure statement (IDS) submitted on 12/24/2003 is in compliance with the provisions of 37 CFR 1.97 and considered by the examiner.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

- Claims 1, 3, 5, 12 and 13 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a). Claim-1 recites an electroactive material comprising an "Li-Mn composite oxide" with spinel structure in Line-3, and further recites adding elements to the pulverized Li-Mn composite oxide with spinel structure in Line-5 for further processing, and the uncertainty exists whether both the materials are the same or whether are different, and the claims are directed to the producing of modified Li-Mn-composite oxide. Clarification and corrections are needed.

There is no per se rule that "double inclusion" is improper in a claim. In re Kelly, 305 F.2d 909, 916, 134 USPQ 397, 402 (CCPA 1962). The governing consideration is not double inclusion, but rather is what is a reasonable construction of the language of the claims." MPEP 2173.05(o).

b). Claim-1 recites adding an element/compound to the Li-Mn-composite oxide with several options in the lines 7-9 separated between ":" that makes it indefinite in that it is not clear whether an element or a combination of an compound and element and other permutations and combinations are necessary for the invention to be practiced, and it is suggested to put them in proper Markush language format per the US practice, while it appears to be a literal translation from the foreign language.

c). Claim-5 recites "at least one element" in Line-3 with several options in the lines 4-6 separated between ":" ",", and "or" that makes it indefinite in that it is not clear whether an element or a combination of an compound and element and other permutations and combinations are necessary for the invention to be practiced, and it is suggested to put them in proper Markush language format per the US practice.

d). Claim-5 recites "Li-Mn composite oxide" in Line-7 and uncertainty exists in which Li-Mn-composite oxide it is referring to in Claim-1/2. Clarification and corrections are needed.

e). Claim-3 recites the limitation of "sintering-shrinkage-initiating" in lines 5 and 6 and recites a limitation of sintering-initiating in Line-10, for which there is insufficient antecedent basis. It is not clear whether both the recited temperatures are the same or different. Correction and clarification for the definiteness of the limitations of the claims.

f). The term "predominantly" in claim s 1, 12 and 13 is a relative term which renders the claim indefinite. The term "predominantly" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Public will not be appeased about the boundaries of this limitation and would not be able to practice the invention without the undue burden of experimentation.

Claim Rejections - 35 USC § 102

Claim Rejections - 35 USC § 103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this

subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

1. Claims 1-2, 5-7 and 11 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Suketani et al (JP 10-302767) in view of Sulzermeco Data Sheet, 2004).

Normally, only one reference should be used in making a rejection under 35 U.S.C. 102. However, a 35 U.S.C. 102 rejection over multiple references has been held to be proper when the extra references are cited to (SEE MPEP 2131.01):

- (A) Prove the primary reference contains an "enabled disclosure; "
- (B) Explain the meaning of a term used in the primary reference; or
- (C) Show that a characteristic not disclosed in the reference is inherent.

Suketani et al disclose making of cathode active material produced by mixing Li-Mn-Oxide and at least a chalcogen of Ge, Zn, Pb, In, Sb and Bi, wherein the parent Li-Mn-oxide

prepared from the constituents in desired ratios, the chalcogen was mixed with the parent oxide and heat treated between 400-700C to form the product, that would meet the limitations of instant claims 1-2 and 5 (Abstract, Sections: 0006, 0011-0012, 0015-0016). The granulation of the particles while mixing the components would be inherent. LiMn_2O_4 passed through Tyler screen of 1-6330 mesh (See Screen data from Sulzermetco) and this would inherently meet the limitation of particle size in instant claims 6-7 (Section:0020). The cell test data in the Tables 1-6 would meet the limitation of instant claim-11 (Section:0029-0036). All the limitations of the instant claims are met.

The reference is anticipatory.

In the alternative that the disclosure be insufficient to arrive at the limitations of the instant claims by the applicants, it would have been obvious one of ordinary skill in the art to make modifications to the process by pulverizing the parent compound to finer particle sizes to benefit from improved reaction between the components and densification of material, because Suketani et al teach these aspects, and with the expectation of reasonable success in obviously arriving at the limitations of the instant claims.

2. Claims 1-2, 5 and 11 are rejected under 35 U.S.C. 102(b) as anticipated by Kasai et al (JP 11-176441)

Kasai et al making o making of cathode active material produced by mixing a parent compound of Li-Mn-Oxide of the formula $\text{Li}_{1+x}\text{Mn}_{2-x}\text{O}_4$ ($0 < x < 1.33$) with at least one element among B, P, Bi, Pb, Ge, Sn and heat treat the mixture between 400-900°C (Abstract, Sections:0010, 0014, 0016). The granulation of the particles while mixing the

components would be inherent. Making of the electrode paste and the cell including the test data would meet the limitation of instant claim-11 (Section:0026-0028). All the limitations of the instant claims are met.

The reference is anticipatory.

3. Claims 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsubata et al (JP 10-321-227).

Tsubata et al disclose positive electrode active battery material of the composition $\text{Li}(\text{Li}_x\text{Mn}_{2-x})\text{O}_4$ ($0 < x \leq 0.18$) with a BET N_2 surface area of $1.5\text{m}^2/\text{g}$ or less, with a primary particle size of 0.5-5 micron and secondary particle size of 5-30 micron and a positive electrode with a porosity of 15-40% (Abstract). Tsubata et al further teach making of a paste for coating electrodes that would meet the limitation of instant claim-13 (Section: 0010). Tsubata et al further teach making of an electric cell and properties of a cell containing non-aqueous electrolyte rechargeable battery (Sections: 0027-0032).

Tsubata does not define the porosity of the active material per the limitations of the instant claims 13 and 14.

The Li-Mn-Oxide of Tsubata is an electrode active material based on Li-Mn-Spinel-Oxide, has a composition nearly identical to those defined by the applicants (Instant Specification: 0040) that would meet the limitation of Li-Mn-Composite oxide in the instant claims 13 and 14. The sample Example-15, by the applicants had a surface areas $0.8\text{ m}^2/\text{g}$ with a particle size of 0.27 microns and a average porosity of 1.7% (Instant Specification: 0148), and applicants data shows the dependence of surface area, particle size and porosity

(Sections: 0109, 0124, 0148). Since, the composite oxide by Tsubata et al is nearly same as that by the applicants in composition and the primary particle size of Tsubata et al of 0.5-5 microns is well within the range of that preferred by the applicants being 0.2-3 microns (Section: 0043), it is the examiners position that the porosity defined by the applicants would obviously be present in the Tsubata's active materials and would meet the limitations of the instant claims by the applicants. This would meet the porosity limitations of the instant claims, thereby all the limitations of the instant claims.

Allowable Subject Matter

- Claims 3, 4 and 8-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and overcoming the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action

The following is a statement of reasons for the indication of allowable subject matter: The prior art of record neither teaches nor fairly suggests the limitations of heating/cooling, sintering in a rotary kiln, granulation and granulation aids meeting the limitations of the instant claims by the applicants. Shirakawa et al (US 6,673,491) disclose the use of granulating agents and granulating techniques in their disclosure, and this can be a prior art because of common inventorship and common assignee, at the time of the disclosure of these co-pending inventions.

Conclusion

- The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Kono et al (JP 11-135119), Hasezaki et al (US Patent 5,911,920), Manev et al (US Patent 6,267,943), Kasai et al (US patent 6,413,673).
- Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kallambella Vijayakumar whose telephone number is 571-272-1324. The examiner can normally be reached on M-Th, 07.00 - 16.30 hrs, Alt. Fri: 07.00-15.30 hrs.
- If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Yogendra Gupta can be reached on 571-272-1316. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.
- Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KMV
June 24, 2004.


Mark Kopec
Primary Examiner